Pest Leaflet

Pacific Forestry Centre 506 West Burnside Road Victoria, B.C.

Spruce spider mite in British Columbia

Valin G. Marshall

Introduction

The spruce spider mite, *Oligonychus ununguis* (Jacobi) (Acari: Tetranychidae), is an important pest of forest and ornamental conifers. The last serious outbreak in British Columbia occurred in 1975 on immature Douglas-fir north of Kelowna when 800 ha were damaged.

Conditions favoring outbreaks are: hot dry weather, overstocked stands, poor sites, susceptibility of some tree species, and absence of natural enemies due to a heavy coating of dust on the foliage or to insecticides that drift to the conifer foliage from adjoining agricultural areas.

Extreme temperatures, strong winds accompanied by heavy rain, and prolonged high humidity limit abundance of the spruce spider mite.

Hosts and distribution

This pest, widely distributed in temperate regions of both hemispheres, is common on conifers in the United States and Canada. The mite may be encountered on potted plants in houses, greenhouses and shadehouses, on seedling in nurseries, and on trees in the field.

Its preferred hosts appear to be spruce *(Picea)*, Douglas-fir *(Pseudotsuga menziesii* (Mirb.) Franco) and juniper *(Juniperus)*, but it has also been collected on hemlock *(Tsuga)*, cedar *(Thuja)*, fir *(Abies)*, pine *(Pinus)*, redwood *(Sequoia)*, Japanese cedar *(Cryptomeria)*, yew *(Taxus)*, cypress *(Cupressus)*, false cypress *(Chamaecyparis)*, incense cedar (*Calocedrus* [=*Libocedrus*]) and larch *(Larix)*. Severe damage occurs only on the first eight genera.

Description

Spider mites are arachnids, and are more closely related to spiders than to insects. The mite's body has no distinct divisions as in insects, but anterior and posterior parts are distinguished at a boundary between the second and third pairs of legs. Lack of pedicel, smaller size and distinct mouthparts separate mites from spiders. The mite has four pairs of legs, except the larval stage, which has three pairs as do insects. The developmental stages are: egg, larva, protonymph, deutonymph and adult. Spider mites are about 0.5 mm long and only the damage or webbing is easily detectable by the naked eye.

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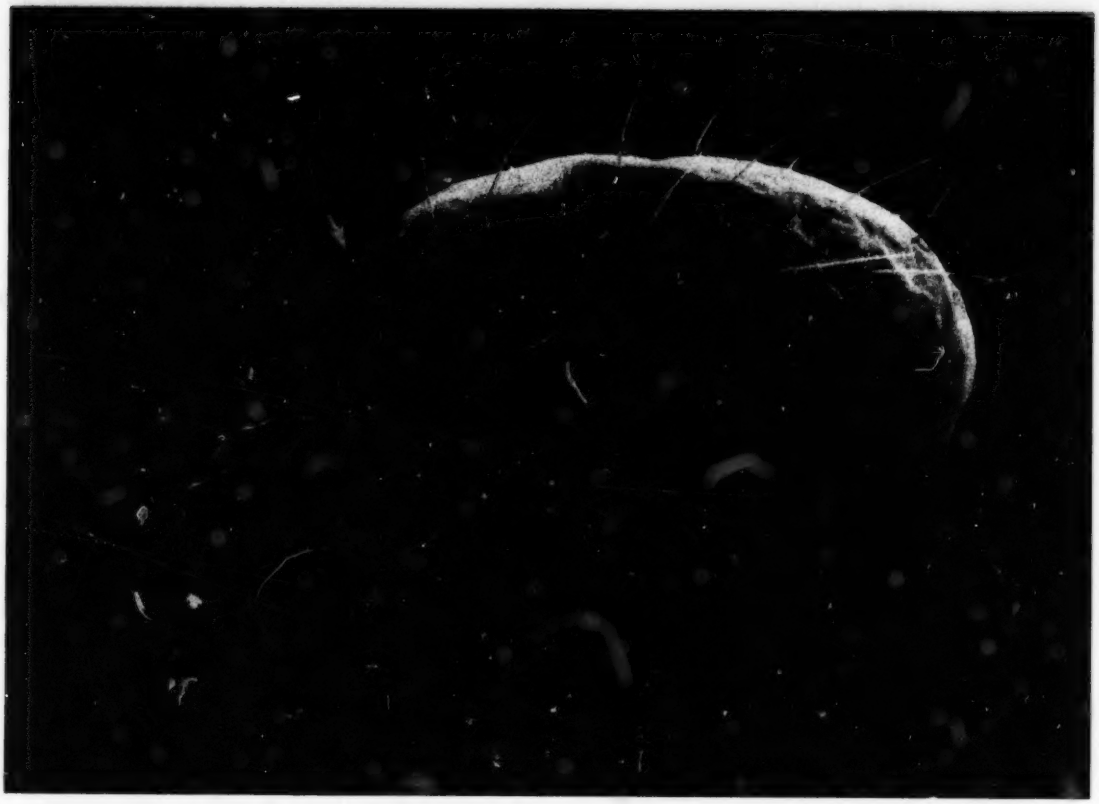

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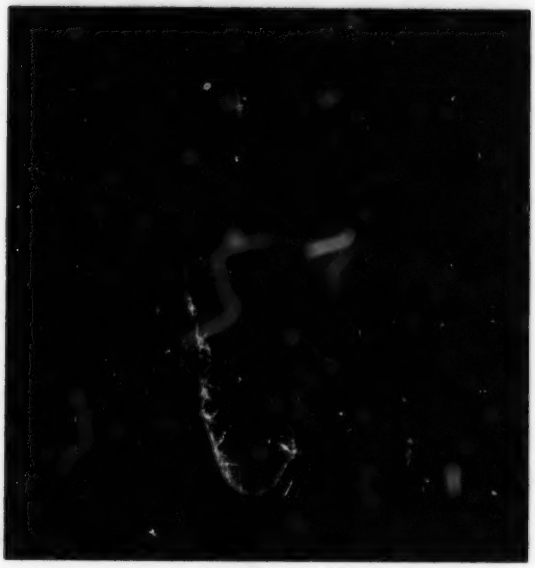

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Figures 1 - 3: Spruce spider mite, *Oligonychus ununguis* (Jacobi). (1) Lateral view of female; note division between gnathosoma (mouthparts) and the rest of the body, an important feature that separates mites from spiders. (2) Dorsal view of female. (3) Dorsal view of male; note stylets for piercing the plant to facilitate feeding and the narrower opisthosoma ("abdomen") of the male compared to the female.

Egg: 0.2 mm; spherical with a stipe or spike that anchors the egg with webbing, pale yellow changing to reddish brown.

Larva: 0.2 mm; pink at first, changing to needle-green after feeding; 3 pairs of legs.

Nymphs: 0.3 — 0.4 mm; the protonymph is light green, the deutonymph dark green and usually larger than the protonymph; 4 pairs of legs.

Adult: 0.58 mm; body dark green to almost black from ingested food; a narrow pale streak on the middle of the back and a pale collar; female larger and more oval than the male which has a more pointed opisthosoma ("abdomen") and longer legs. The dorsal surface bears strong hairs; legs are salmon pink; mouth parts are sharply pointed for piercing and specially adapted to sucking.

Life history and habits

Spruce spider mites are extremely prolific, with a possible seven generations each year in British Columbia. Eggs are laid along the underside of twigs and at needle bases, but never on the needles themselves. Hatching of the first generation begins about May; the second generation begins to appear by mid-June. Succeeding generations are produced during the summer and early fall. Overwintering eggs are laid in protected areas at the base of needles or on twigs, in September and October. Fertilized females lay up to 45 eggs in a lifetime, about 70% of which become females. Unfertilized females produce male offspring only. The threshold of activity is about 7°C and diapause terminates after a resting period when eggs are exposed to a temperature of 20°C. Mites disperse on wind currents, by adults crawling from tree to tree, and on nursery stock.

Damage detection

These mites suck the sap of trees, resulting in a mottled, bleached discoloration of the needles. Severely infested foliage becomes yellowish or brownish and many needles drop. Damage is most severe in the lower crowns of large trees. Seedlings and small trees are often killed, and in some cases, large areas of mature timber are destroyed. The mites spin a webbing of fine silk around twigs among the needles. The webbing becomes more abundant as the season progresses, and is best seen when the branches are raised and viewed from the underside. If twigs are tapped sharply over a sheet of white paper, mites may appear as minute moving specks on the white surface.

Preventive control

Maintain healthy vigorous plants as they are less susceptible to mite attack. Handle transplants with care so that they are not damaged; keep their roots moist, and plant them on good growing sites with adequate spacing. Weekly spraying of trees with a strong stream of water will wash away some of the mites and prevent construction of webbing which protects the eggs and the young.

Natural control

Natural enemies of tetranychid mites include pathogens, viruses and predators. Among the latter are phytoseiid mites, spiders and insects in the orders Coleoptera, Neuroptera, Hemiptera, Thysanoptera and Diptera. None of these has been tested specifically against the spruce spider mite, but species of *Typhlodromus* (Phytoseiidae) may be important in containing this pest at endemic levels below economic thresholds.

Chemical control

Miticides (or acaricides), applied as sprays, should be used as specified by the manufacturer. Spraying should be completed by the end of May. If improperly used, miticides may be harmful to fish and wildlife, as well as to humans.

Further information may be obtained from:

Canadian Forestry Service
Forest Insect and Disease Survey
Pacific Forestry Centre
506 West Burnside Road
Victoria, B.C. V8Z 1M5
(604) 388-0600

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